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of substances by living protoplasm, a thing possible through a self-regulated change in the condition of permeability of the plasmatic membranes such that the organism is able at pleasure to reverse it." He finds that the ferment of Roman bread and Chianti wine truly secretes invertase, by the augmentation of the permeability of the protoplasm during the period of fermentative activity. This increased permeability is general, various salts escaping more freely at the same time. In *Mucor stolonifer*, however, the emission of invertase seems to have the character of a free exit of materials from dying parts, coincident with spore formation. Whether it has a true but weak secreting power remains for further study.—C. R. B.

Respiration.— PALLADIN distinguishes[25] three sources of the respiratory CO_2 of plants: (1) nucleo-CO_2 produced by the action of enzymes, which, partly soluble, partly insoluble in expressed sap, are intimately bound up with the protoplasm; (2) stimulation-CO_2, formed by the protoplasm itself (apparently directly) under the action of stimuli; (3) oxydase-CO_2, produced by various oxidases. The process which characterizes animal and plant life consists in the excretion of nucleo-CO_2 which is formed by decomposition without the participation of atmospheric oxygen. Intramolecular respiration is a primary phenomenon, whose CO_2 is principally nucleo-CO_2 and in some cases also stimulation-CO_2. But alcoholic fermentation is no simple phenomenon, and, as KOSTYTSCHEW has shown, must be distinguished from intramolecular respiration.— C. R. B.

Apple and pear rot.— LONGYEAR[26] has published the results of his study of a rot of apples and pears due to an undescribed species of Alternaria. The same disease has so far been found in California, Colorado, and Michigan, and in Colorado is one of the most widely distributed and common diseases of apples. PADDOCK[27] was the first to call attention to it. In the case of the apple the disease attacks the fruit only, but it attacks the fruit, leaves, and young sprouts of the pear. In the apple it appears frequently first at the blossom end of the fruit and, in the case of sorts having a deep calyx-tube, a core-rot may occur. The disease may be controlled by spraying with Bordeaux mixture and plowing under or removing the diseased fruits in which the fungus is able to pass the winter.— E. MEAD WILCOX.

Reduction division.—The earliest organisms were doubtless non-sexual. In phylogeny, according to SCHAFFNER,[28] the conjugation of nucleated cells introduced

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[25] PALLADIN, W., Ueber den verschiedenen Ursprung der während der Atmung der Pflanzen ausgeschiedenen Kohlensäure. Vorlaufige Mitteilung. Ber. Deutsch. Bot. Gesells. **20**: 240–247. 1905.

[26] LONGYEAR, B. O., A new apple rot. Bull. Col. Agric. Exp. Stat. 105: 1–12. *pls. 1–4.* 1905.

[27] PADDOCK, W., A new apple disease. Rept. Col. Exp. Stat. **17**: 99. 1904.

[28] SCHAFFNER, JOHN H., The nature of the reduction division and related phenomena. Ohio Naturalist **5**:331–340. 1905.